TEXTILE READER'S GUIDE

Classification of Contents

Fibers 1268

Yarn Production 1271

Fabric Production 1274

Dyeing and Printing 1275

Special Finishing 1277

Testing and Measurement 1279

Chemistry and Physics 1281

Index to Authors ..... Last Page

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Abstracts

[1268]

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The large friction of wet cotton, linen, and rayon affects the comfort of the wearers of such materials. This disadvantage is eliminated by urea-HCHO finishes containing sulphates, chlorides, nitrates, or acetates of Zn, Cd, Mn, or Cu to buffer the system of pH 6.0-6.5.

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The new method of treatment consists of

steeping for about ½ hour in a solution of an alkali having a pH exceeding 7, then removing excess of the alkaline solution and exposing the proteinate threads to the vapor of epichlorhydrin at an elevated temperature, say 65° C. for several hours, within a closed vessel so that the vapor has the opportunity to permeate the threads evenly and form with them an additive compound involving a splitting of the epoxy ring structure.

Surface area measurements of cotton fibers before and after swelling

Florence H. Forziati, Robert M. Brownell and Chas. M. Hunt. *J. of Research NBS 50,* 139-45 (March, 1953).

Surface areas of cottons differing in variety and maturity and cottons that had been subjected to various physical and chemical treatments were measured before and after swelling. Swollen cottons were prepared by immersing air-dried cottons in water at room temperature for 24 hours, displacing the water with methanol and the methanol with pentane, and finally drying the fibers. Surface areas were calculated from the quantity of nitrogen adsorbed at −195.8°C. The specific surfaces of unswollen fibers were less than 1 sq. meter per gram; those of the swollen fibers ranged from 4 to 148 sq. meters per gram.

Artificial fibers A 2

Fiber forming copolymer

Earl W. Gluesenkamp and Geo. E. Ham (The Chemstrand Corp.); U .S. P. 2,637,721 (May 5, 1953).

A polymer of acrylonitrile and other olefinic monomers is rendered dye-receptive by conversion to a portion of the nitrile groups if imine groups by reaction with an alkyl haloacetate.

Dry spinning apparatus

Walter H. Hammon, Laurence C. Holt, Rodger L. Schaefer (The Chemstrand Corp.); U. S. P. 2,636,217 (April 28, 1953).

Yarn production comprises extruding an acrylonitrile polymer solution into a countercurrent gas stream to remove the solvent from the shaped article wherein the solvent-laden gas is diluted with solvent-free gas heated to the solvent boiling point at a point near the spinneret.

Fiber forming blended polymers

Costas H. Basdekis (The Chemstrand Corp.); U. S. P. 2,637,717 (May 5, 1953).

A method of preparing a mixture of fiber

forming polymers comprises mixing together an acrylonitrile polymer, an aqueous emulsion of a polymer containing a tertiary amine and a stabilizing agent.

Identification of synthetic fibers

A. N. J. Heyn. *Textile Res. J. 23,* 246-51 (April, 1953).

A simple method is described for the differentiation of synthetic fibers by their refractive indices and birefringence, using the technique of central illumination.

Protein yarns

Courtaulds Ltd.; B. P. 690,501 (April 22, 1953).

A process for producing artificial protein yarns comprises extruding an aqueous alkaline solution of a protein into an aqueous coagulating bath containing sulfuric acid and aluminum sulfate.

Rayon production

Ralph H. McKee. U. S. P. 2,637,069 (May 5, 1953).

Apparatus and method for producing rayon comprise nozzles, treating baths, and successive pairs of rollers, wherein a roller in each pair is superposed and tiled with respect to the other roller so as to provide adequate stretching of the yarn passing therearound.

Regenerated keratin fibers

Courtaulds Ltd.; B. P. 690,566 (April 22, 1953).

A process for producing regenerated keratin yarns comprises extruding an aqueous solution of keratin which has been subjected to pretreatment with peracetic acid into an aqueous coagulating bath, and stretching and hardening the yarn.

Skin and core of rayons

S. Okajima, S. Hayama, and K. Kobayashi. *Bull. of Chem. Soc. of Japan 25,* 275-9 (August, 1952) ;*in English.*

The degree of orientation of the skin and core of a fiber are measured by the peeling-off heterogeneous acetylation method and the effect of the conditions of acetylation upon them is discussed. The skin structure is shown by this method in the cases of the tire cord and even cuprammonium rayon. The resistance of the skin against penetration and dispersion seems larger than that of the core.

Tube production

Wm. C. Huebner (The Huebner Co.); U. S. P. 2,636,216 (April 28, 1953).

The method of producing yarn or tubing from a solidifiable composition containing electrically chargeable material comprises establishing an electrostatic field of force across an atmospheric gap between an electrode within an extruder and a second electrode located on the tube collection unit.

Yarn crimping

Hans M. Hemmi (Sandoz Ltd.); U. S. P. 2,636,250 (April 28, 1953).

A process for crimping heat-settable fibers comprises subjecting the fiber to the action of two crimpers consisting of interengaging cylinders whereby the crimping surface for each cylinder is more than a half circle but less than a complete circle.

Yarn production

Brit. Celanese Ltd., B. P. 689,040 (March 18, 1953).

Method for the production of yarn having a large cross section comprises passing a thread of fibers of finer cross section through a body of volatile solvent liquid and causing the thread to continue beyond the body of liquid until it is set by the drying off of the solvent liquid.

YARN PRODUCTION B

Fiber Preparation B 1

Blending fibers

Robert C. Wilkie (Pacific Mills); U. S. P. 2,636,222 (April 28, 1953).

A method of blending fibers of different characteristics comprises forming the fibers into sheets of fibers, cutting the fibers, superimposing the sheets of fibers, shearing and drafting the fibers, and forming said sheets into a helical roll, and delivering said roll in sliver form.

Rayon staple in the cotton system

P. de Marsano and W. Wisser. *Enka Breda Rayon Revue 7*, 1-11 (1953).

Developments leading to the construction of the Le Blan-Roth drafting system are discussed. Special attention is paid to the "breakdraft" when spinning rayon staple. The conclusion is drawn that drafting mechanisms equipped with dead weighted toprollers on the feeding cylinder may cause difficulties. Solutions for the problems are

given, the reliability of which has been proved in practice.

Tow to top

Robert H. de Lacotte and Emmanuel Teissier (Societe de Constructions Mercanique de Stains); U. S. P. 2,635,295 (April 21, 1953).

Apparatus for producing staple fibers comprises feed rolls, stretch rolls, and a single rotary member between the rolls which contacts the bundle to deflect the bundle from a straight path of travel, which action localizes the points of breakage in the filaments.

Carding and Combing B 2

High-draft drawing frame

A. Pikkemaat. *MelliandTextilber. 34*, 270-72 (April, 1953); *in German.*

The author describes two new constructions: the Inter-Draft Drawing Frame and the Super-Draft System. For both these machines, he gives examples of how they should be adjusted to suit various staple lengths of cotton or rayon staple. A third system known as the Inter-Super-Draft Drawing Frame has been developed for synthetic fibers, and is also described in detail. Finally, the author compares these high-draft drawing frames with other systems, and points out the advantages of the former.

Spinning B 4

New double process with hollow spindles

H. Rettenmund and M. Lattion. *Melliand Textilber. 34*, 276-78 (January, 1953); *in German.*

The Sirnach doubling or twisting spindle operates without flyer, ring, and traveller. It can be installed in any twisting or doubling frame with several rows of bobbins. Even when the spindles revolve at high speed, the thread tension is low; spindle speeds of up to 28,000 r. p. m. may be used. The production is 70-100% higher than when normal doubling spindles are employed. Hard twists can be obtained in one operation.

Strand-former balloon control

Jos. A. Truitt (American Viscose Corp.); U. S. P. 2,635,413 (April 21, 1953).

The invention provides for the control of balloons formed in twisting devices of the multiple twist two-for-one down twister type wherein a doubled strand is formed and collected on the down twister whereby strand tension is maintained uniform.

Tail winder for yarn packages

Albert E. Winslow (J. P. Stevens and Co., Inc.); U. S. P. 2,638,279 (May 12, 1953).

In a yarn winder there is provided a tail winding guide adapted to hold the yarn out to be wound at one end of the package for forming a tail thereon.

Winding and Spooling B 5

Grid tension stop device

Wm. H. Shontz (American Viscose Corp.); U. S. P. 2,635,821 (April 21, 1953).

The present invention provides a device which may be attached to a winding machine for preventing chatter or vibration of grid tension devices to reduce breaking and straining of the strand during the winding operation.

Method of drying wound packages

John E. Phillips, Jr. (American Viscose Corp) U. S. P. 2,635,352 (April 21, 1953).

The invention provides a method of drying regenerated cellulose yarn packages without a central support by conveying the packages through a high frequency electrical field while allowing free shrinkage to produce a yarn of improved uniformity of residual shrinkage and dyeing characteristics.

Strand catcher

Henry J. McDermott (American Viscose Corp.); U. S. P. 2,634,491 (April 14, 1953).

Method and apparatus for catching and collecting running strands comprises severing the strand by impact while simultaneously applying suction to capture the loose strand ends.

Thread storage and advancing reels

Courtaulds Ltd. B. P. 690,713 (April 29, 1953).

A thread storage and advancing reel comprises a rotating cage formed by two reel members each having bars which interdigitate to advance helical yarn turns introduced into the cage by way of the hollow shaft.

Textile package dyeing

Ernest A. Stienen. U. S. P. 2,637, 992 (May 12, 1953).

The invention provides an improved spindle for dyeing yarn packages thereon wherein the volume of dyeing liquid passing through the spindle is increased to enable more units to be dyed per spindle.

Winding apparatus

Ernest K. Bauer and Paul E. Hill (American Viscose Corp.); U. S. P. 2,635,321 (April 21, 1953).

The invention relates to winding machines of the type which comprises a yarn compacting pressure roller which presses against the surface of the yarn windings on a collecting reel wherein separation of the pressure roll from the surface of the windings is effected when the collecting roll is decelerated or stopped.

Yarn cake holder for winders

Robert L. Carroll. U. S. P. 2,635,829 (April 21, 1953).

A cake holder for receiving a tubular cake of yarn comprises a spindle, a pair of elongated segmental members extending parallel to the spindle which members are adapted to move outwardly away from the spindle to contact the inner periphery of the yarn cake to hold the cake in position.

Yarn manufacturing

Harry J. Kuljian (The Kuljian Corp.); U. S. P. 2,634,449 (April 14, 1953).

A wiping device for removing liquid from the surface of a rotatable yarn advancing reel.

Yarn package fluid treatment

Ernest A. Stienen. U. S. P. 2,637, 993 (May 12, 1953).

The invention provides apparatus which adjusts the density of the yarn package undergoing liquid treatment to insure uniform treatment thereof.

Yarn twist-detecting and arresting device

Hugh E. Hays (American Viscose Corp.); U. S. P. 2,635,831 (April 21, 1953).

In apparatus for withdrawing strand from a package, there is provided means which functions normally as a strand guide but which prevents withdrawal of the strand which is wound or twisted in the opposite direction of that desired.

FABRIC PRODUCTION C

Yarn preparation C 1

Sizing composition

J. R. F. Jackson and H. Sager (I. C. I. Ltd.); *Brit. Rayon and Silk J. 29,* 80; B. P. 687,407 (February 11, 1953).

A sizing composition which gives good fiber

lubrication, prevents separation of the individual strands, and protects the yarn against damage by abrasion is based on a mixture of casein, with a suitable peptizing agent for this, a wax dispersed in an aqueous medium, a dispersing agent, and urea. It is useful to add an agent that will prevent putrefaction of the casein and this may be a chlorinated phenol or the sodium salt of salicylic anilide.

Weaving C 2

Multi-ply film package

Ruby J. Swartz and James E. Snyder (Wingfoot Corp.); U. S. P. 2,635,742 (April 21, 1953).

A package in which the packaged material is enclosed in a multi-ply wrapper wherein at least one ply is a non-fibrous organic film and wherein a plasticizer for the organic film is placed between the plies and adjacent the film.

Plastic welding

Preston B. Carwile (Raytheon Mfrg. Co.); U. S. P. 2,633,894 (April 7, 1953).

A method of fastening together pieces of thermoplastic material comprises grasping the pieces between jaws of heat insulating material, and vibrating at least one of the jaws to cause undulating distortions of the material to generate heat therein.

Seaming apparatus

Raymond I. Hakomaki and Thos R. James (General Mills, Inc.); U. S. P. 2, 635, 673 (April 21, 1953).

Apparatus for seaming layers of thermoplastic sheet material comprises a heated seaming member movable between operative and inoperative positions wherein movement between the material and seaming member can only take place when the heated member is in its operative position.

Stocking fabric

Sam Tait, Jr. (Vogue Mfrg. Corp.); U. S. P. 2,636,369 (April 28, 1953).

A knitted stocking fabric comprising plural yarn loops composed of mono-filament yarns with the yarns spaced from one another at least partially along the lights of the loops.

DYEING AND PRINTING E

Contrast dyeing of acetate and viscose rayon

C. Th. Speiser. *Textil-Rundschau 8*, No. 1, 9-12 (1953), *in German; Brit Rayon and Silk J. 29*, 74 (1953).

A method is described whereby it is possible to produce cross-dyed fabrics with soluble vat dyes. Some indigosols have special affinity for acetate and others for viscose. A list of the respective dyes is given. This differential behavior is enhanced by a special dyeing technique using a two-stage method. First the acetate indigosols are applied in a bath containing a reducing agent and sulphuric acid, after which the goods are rinsed. Dyeing is then continued with the viscose indigosols in the presence of an electrolyte, and the color on both fibers is then developed with sodium nitrite and sulfuric acid.

Dispersion of direct dyes in aqueous solution

A. Banderet and P. Meyer. *Bull. Soc. Chim. Fr.* 53-60 (January, 1953), *in French; Brit. Cotton Ind. Res. Assoc. 33*, 245 (April 15, 1953).

The methods of Debye et al developed for the determination of molecular weight by means of the angular distribution of light intensities diffused from a solution of the material have been used to study the constitution of aqueous solutions of a substantive dye. The object of the work was to investigate the role played by temperature and added salt concentration in dyeing with substantive dyes. Results suggest the existence of micelles larger than the largest Blumer spheres (2820 Å radius), such micelles causing the small angle scattering. Large micelles increase in quantity with increased concentration of sodium sulphate and decrease with increased temperature. The turbidity experiments were related to dyeings on cotton and on cellophane. Speed of dye uptake was found to depend much more on the material to be dyed than on either the temperature or the dye concentration.

Dyeing acrylonitrile

Geo. L. Wesp and Geo. E. Ham (The Chemstrand Corp.); U. S. P. 2,636,802 (April 28, 1953).

Process of dyeing acrylonitrile fibers with acid dyes using zinc chloride.

Dyeing Acrylonitrile copolymer fibers

Geo. E. Ham (The Chemstrand Corp.); U. S. P. 2,637,620 (May 5, 1953).

Method of dyeing fiber-forming acrylonitrile copolymers with acid dyes and thiourea.

Dyeing of wool and rayon staple slubbing

A. K. Gunther. *Melliand Textilber. 34,* 328-30 (April, 1953).

The author described the machine dyeing of wool and rayon staple slubbing, and deals in particular with the Abbott Slubbing Dyeing Machines. He also discusses the design and operation of the various spindle and tube machines, and points out the features of the process developed by Nitschke. Drying aggregates are also dealt with.

SPECIAL FINISHING F

Action of surface-active agents

Henri L. Rosano and Marianne Weill. *American Dyestuff Reporter 42,* 227-229 (April 13, 1953).

In a study of the physical action of surface-active agents in the mechanism of detergency the authors adopted the tensiometric technique to the interfacial wetting and "dewetting." The behavior of oil drops on a solid immersed in water and in an aqueous detergent solution were visually observed.

Cotton Glove fabric treatment

Robert N. Russell. U. S. P. 2,637,662 (May 5, 1953).

A method of treating cotton glove fabric to retain the new and soft characteristics includes impregnating the fabrics with a solution containing mineral oil, lanolin, stearic acid, propylene glycol, triethanolamine, terpineol-almond extract, quince seed gum, water, a penetrant, and a wetting agent.

Crease and shrinkage resistant textiles

Leo Beer. B. P. 689,102 (March 18, 1953).

Process for crease and shrink proofing cellulosic fabrics comprises impregnating the textile with an aqueous solution containing monomethylol dimethyl hydantoin with dimethylol urea and a water soluble non-volatile acid, drying and baking the textile, and then neutralizing and washing the fabric.

Fire resistant textiles

Clarence B. White (Federal Leather Co.); U. S. P. 2,634,218 (April 7, 1953).

Production of flame resistant textiles comprises impregnating the textile with a solution of antimony trifluoride and a peptizing salt, and treating the dried textile with a solution of an

alkali carbonate to form antimony trioxide in the textile.

Heat treatment of yarns

British Celanese Ltd. B. P. 689,175 (March 25, 1953).

A process for the heat-treatment of thermoplastic yarns comprises feeding the yarn through a tubular chamber heated above the softening temperature of the yarn while passing a gas through the chamber to aid in closely controlling the yarn temperature.

Nontacky and nonblocking films

Harry E. Connors and Arch L. Hatfield (The B. F. Goodrich Co.); U. S. P. 2,636,870 (April 28, 1953).

The invention pertains to the production from monomeric vinylidene chloride, vinyl chloride, alkyl acrylates, and alkyl alkacrylates, of aqueous polymeric dispersions having new and unique film forming properties.

Rayon stabilization

Arthur R. Wachter. *Textile World 103,* 122-23, 224, 226, 228, 230 (May, 1953).

The Aquex, Avcoset and X-2 treatment for rayon stabilization toward shrinkage and abrasion are discussed and compared. The nature, methods of application and claims of the sponsors of each treatment are presented.

Strand treatment

Henry J. McDermott (American Viscose Corp.); U. S. P. 2,634,597 (April 14, 1953).

An apparatus for treating strands with a plurality of different liquids as the strand travels about a rotor, whereby intermingling of the liquids is prevented by providing a plurality of notches about the rotor where separation of liquids is required.

Strand treatment

Pyam L. Pendleton and Everett L. Sherman (Hampton Machine Co.); U. S. P. 2,634,596 (April 14, 1953).

Apparatus for reducing the rate of travel of a continuously moving strand of fibers in one section of a continuous process so that this section becomes a yarn storage area to permit the strands to dry or to absorb treating liquid.

Textile finishing

Donald H. Powers (Monsanto Chemical Co.); U. S. P. 2,635,056 (April 14, 1953).

A finishing agent for textiles consists of a col-

loidal solution of silica in water containing a water-soluble polyhydric alcohol.

John R. Janes (Deering Milliken Research Trust); U. S. P. 2,637,623 (May 5, 1953).

A process of treating organic textile materials to modify the physical characteristics thereof comprises impregnating the material with compounds having the general formula RnSi [-O-Y-N (tert) X] $_{4}$-n, drying the material, and heating the material to bond the reaction products to the material.

Textile material impregnation

Joseph Rockoff (The Dayton Rubber Co.); U. S. P. 2,637,892 (May 12, 1953).

An apparatus for impregnating textiles comprises a sizing bath, textile guide rolls which also transfer liquid from the bath to the textile, and a slasher roll cooperating with one of the guide rolls to control the liquid remaining in the textile.

Textile treating

Hans G. Figdor. U. S. P. 2,635,055 (April 4, 1953).

An aqueous emulsion for water-proofing textiles comprises a wax, an amine soap of a saturated fatty acid, a polyvalent metal salt of an organic acid, and a water-soluble non-ionic surface active agent.

Textile treating

Jack T. Thurston (American Cyanamid Co.); U. S. P. 2,637,663 (May 5, 1953).

Textile softening agents consist of sulfosuccinic acid polyesters of fatty acid monoglycerides.

TESTING AND MEASUREMENTS G

Instruments and Instrumentation G 2

Chlorine retention in finishes

Susanne Davison and Marian K. Knight. *Amer. Dyestuff Reporter 42,* 261-3 (April 27, 1953).

A proposed accelerated chlorine test was applied to experimental melamine-formaldehyde resin-finished rayon fabrics and it was concluded that strength loss during laundering was accelerated by the action of light, and that high strength losses observed in fabrics with certain types of resin finishes were the result of aging of fabrics which had adsorbed chlorine during laundering.

Detecting yarn faults during winding

J. A. Matthew and J. L. Spencer-Smith. *J. of Textile Inst. 44,* T77-94 (March, 1953).

Yarn slubbers have been developed for application to normal or high-speed winding machines which use two identical guaging heads to measure the size of successive short lengths of the running yarn and to compare them with a control. By suitable arrangements in the measuring circuits associated with the guaging heads, a device or cutting, stopping or clamping the yarn can be made to operate when any piece of the yarn being wound differs from the average size by more than a predetermined amount, so that the defective piece of yarn can be removed before it passes on to the yarn packaging. By substituting counters instead of the yarn clamping device, the apparatus can be used as a tester of quality of yarn for weaving. The methods employed for measuring the size of yarn may be pneumatic or electronic.

Effect of conditioning on crease-recovery

H. Y. Jennings. *American Dyestuff Reporter 42,* P268-71 (April 27, 1953).

The effect of a resin in improving the recovery of a fabric from creasing was investigated and it was found that untreated rayons upon long conditioning yield crease recovery angles in the range of resin-treated rayons. Resin-treated rayons exhibit a much more rapid recovery of crease-resistant properties, but a 24 hour reading is usually greatly exceeded by extending conditioning, therefore, it is suggested that the resin-treated rayon be subjected to three rapid and consecutive dry cleanings before the 24 hour conditioning. A water blank should be prepared in any comparison of treated and untreated rayons.

Electrical resistance of textile materials

J. W. S. Hearle. *J. of Textile Inst. 44,* T117-198 (April, 1953).

A paper is presented giving the results of investigations on the electrical resistance of textile materials which include the influence of moisture content, the effect of temperature, miscellaneous effects and theory. Copies of this article are not obtainable, but the journal is available for loan.

Identification of damage to rayons

E. Kornreich. *Dyer 109,* 57-63 (1953); *C. A. 47,* 4091 (April 25, 1953).

The procedure is used for cellulose acetate fiber and consists of treating the fiber with 9%

NaOH. Normal fibers dissolve in four minutes. The undissolved portions indicate damage by alkali. Slow dissolution indicates damage by heat, rapid dissolution indicated damage by oxidation, acid, alcohol, or alkaline hydrolysis.

Stick-slip

G. W. Bartlett, T. M. Smith and H. A. Thompson. *Modern Textiles Mag. 34,* No. 4, 51, 93-95; No. 5, 50, 52, 54, 60 (1953).

Methods for determining the frictional qualities of filament yarns and staple are presented including descriptions of a Surface Friction Analyzer, a pretensioning device, a Slow Speed Friction Tester, a Yarn-On-Yarn Friction Tester and a continuous roving tester. The devices are illustrated and results of tests run on them are given in the form of charts.

Testing apparatus

Victor T. Fahringer, U. S. P. 2,636,951-2 (April 28, 1953).

Apparatus for detecting irregularities in web and strand material.

The birefringence of dacron polyester fiber

Richard G. Guynn, Richard Steele. *Textile Res. J. 23,* 258-9 (April, 1953).

The birefringence for Dacron as measured by Heyn is corrected. In making the new measurement the author used a "wedge" method wherein a flat wedge is cut at the end of the fiber and the black interference bands exhibited by the wedge between crossed nicols of monochromatic light are observed. The number of such bands gives directly the order of interference plus 1.

Wear testing apparatus

B. P. 686,330. Linen Industry Research Assoc. *Textile Mercury 128,* 565-7 (March 27, 1953).

A new wear-testing apparatus has been designed which endeavors to take into account the fact that during normal wear a fabric is not only subject to rubbing and friction but is frequently subject at the same time to repeated distortion by stretching, relaxation and bending. The design of the apparatus is such as to allow this distortion to be produced simultaneously with the rubbing. Illustrations of the apparatus is given.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS I

Apparatus for measuring gas permeability of

sheet materials

D. W. Brubaker and K. Kammermeyer. *Analytical Chem. 25,* 424-26 (1953).

An apparatus and procedure for use in determining the permeability of sheet materials are presented. The operation of this apparatus is based upon the principle of measuring a change in volume at conditions of constant pressure and temperature. Typical permeability data obtained are included. The significance of the apparatus and procedure lies in its general applicability and in the fact that results may be obtained rapidly and with a high degree of accuracy.

Cellulose Esters

B. P. 690,700 (April 29, 1953). British Celanese Ltd.

Process for the manufacture of cellulose esters having less than the theoretical maximum acyl value comprises forming a solution of a cellulose triester in an anhydrous mixture containing alcohol and ripening the triester until it has the desired acyl value.

Cellulose ethers

Wiley M. Branan, Lawton A. Burrows, Bill M. Mackey, U. S. P. 2,636,879 (April 28, 1953).

A process for producing water soluble sodium carboxymethyl cellulose comprises reacting purified cellulose granules having an average particle size of less than 150 microns with aqueous caustic alkali solution and an etherifying agent wherein the cellulose to etherifying agent mol. ratio is 1.3 to 0.7.

Coated paper and process

Julian L. Azorlose and Donald P. Hug (Hercules Powder Co.); U. S. P. 2,635,972 (April 21, 1953).

A felted fibrous material of improved properties comprises cellulosic paper making fibers and a water-soluble salt of a carboxy-alkyl hydroxyalkyl cellulose.

Degradation of cotton and wood pulp with ligninsulphonic acid and sulphite waste liquor

N. Hartler and O. Samuelson. *Svensk Papperstidn. 55,* 851-62 (November 30, 1952); *J. Soc. Dyers and Cols. 69,* 105 (March, 1953).

A study of the hydrolysis of cellulose fibers with sulphuric acid, high-molecular ligninsulphonic acid, and sulphite waste liquor showed that at acid concentrations, giving the same inversion velocity of cane sugar, an appreciably slower degradation of the cellulose fibers was

obtained with ligninsulphonic acid than with sulphuric acid. The fractions of the cellulose fibers that are accessible to the low-molecular acid are not penetrated by the high-molecular. Although sulphite cooking takes place in a mixture of high- and low-molecular acid, the course of degradation is due to a low-molecular acid, which can be explained by the Donnan theory.

Determination of molecular weight

H. P. Frank and Gabor B. Levy. *J. of Polymer Sci. 10,* 371-78 (April, 1953).

The molecular weight of selected polyvinylpyrrolidone samples was determined by light scattering and by osmotic pressure in methanol. The corresponding limiting viscosity numbers were also determined, as well as the limiting viscosity number of the same samples in water. The data relating to the methanolic system conform with theory and the values for K and L in [ ]= KM were determined. The data relating to aqueous solutions do not show such

Heterogeneous acetylation of rayon

S. Okajima, S. Hayama, and K. Kobayashi. *Bull. of Chem. Soc of Japan 25,* 271-5 (August, 1952) ; *in English.*

The heterogeneous acetylation of rayons was tried under unswollen states and these experiments are described. The acetylation was shown to be fiber heterogeneous and succeed concentrically from the outer surface. The surface layer can then be removed nearly quantitatively by treating with chloroform. This reaction may be suitable for the peeling-off of rayons. A description of the microscopic observation of the acetylated fibers is included.

Improving surface area of cellulose derivatives

H. Grotjahn and K. Hess. *Kolloid Z. 129,* Nos. 2-3, 128-32 (1952) ,*in German; Brit. Cotton Ind. Res. Assoc. 33,* 284 (April 30, 1953).

The large interior surface areas of natural and regenerated cellulose fibers which become available by aqueous swelling action are lost again by drying. The fiber can be kept open by replacing the water being removed from the interior by organic liquids which inhibit loss of swelling and which, on subsequent removal, leave the fiber in a dry but swollen and hence highly active, state. The effect of such organic liquids, which include pyridine, ethanol, ethanol-ether mixture and butanol, have been studied, the available surface area being determined by the adsorption of argon at −196° C. Similar investigations were made on ground cellulose fibers.

Magnetic anisotropy of cellulosic materials

L. Loeb and L. A. Welo. *Textile Res. J. 23,* 251-57 (April, 1953).

The results of a survey of the magnetic anisotropy of a group of cellulosic materials measured according to the Krishnan "oscillation" method are presented. The technique is described for the application of this method to the measurement of the anisotropy of fibrous materials. Experimentally it was found necessary to subject the samples to brief pretreatment with cold, dilute acid in order to obtain concordant results for a given material. Data are given to show the effect of the observed anisotropy of variations in this pretreatment. The results of magnetic anisotropy measurements are discussed as to their possible usefulness in characterizing molecular orientation. It is shown that for materials of a given crystalline modification (cellulose I or II), the observed anisotropy is primarily a function of molecular orientation, but that the anisotropy varies with orientation in a different manner for the two crystalline modifications. The influence of variations in the amount of crystalline material on the observed anisotropy are also briefly discussed.

Improving bonding properties of polyethylene plastics

Werner H. Kreidl, U. S. P. 2,632,921 (March 31, 1953).

The method of printing on polyethylene film comprises subjecting the film surface to an elevated temperature to improve its bonding properties while maintaining the material adjacent the surface at lower temperature to maintain this portion in effective condition to receive printing.

Metal to plastic bonding

Louis C. Rubin (The M. W. Kellogg Co.); U. S. P. 2,638,523 (May 12, 1953).

An article of manufacture comprises a plastic component of a thermoplastic polymer of trifluorochloroethylene and a metallic component comprising finely divided metal particles.

Pre-treatment of cellulose on alkali-cellulose

B. P. 686,843 (January 14, 1953). Rayonier Inc. *Brit. Rayon and Silk J. 29,* 80 (April, 1953).

Five types of surface-active agents are specified for pretreating the cellulose or alkali-cellulose, used in the manufacture of viscose rayon, so that there remains 0.01 to 0.20% of the agent calculated on the bone-dry weight of cellulose

to produce a viscose which generally gives less trouble at all stages in its conversion to rayon fibers, especially when a dulling agent such as TiO_2 or a dispersed mineral oil is present.

Processing paper

Ira C. Cowie and Jasper H. Purcell (Glassine Paper Co.); U. S. P. 2,635,509 (April 21, 1953).

A method of super-calendering sheets of hydrated fibrous material comprises directing a plurality of separated sheets of the material toward a meetting point, pressing the sheets together at the meeting point while ironing the outer surfaces thereof, separating the sheets and repeating the process.

Reaction of cellulose acetate with acetic acid and water

L. A. Hiller, Jr. *J. of Polymer Sci. 10,* 385-423 (April, 1953).

Reaction curves for the simplest of cellulose acetylation systems: namely, the homogeneous reaction of secondary cellulose acetates with acetic acid and water, were studied. These reactions were found to be slow and complex, consisting of two interdependent simultaneous reversible second-order processes. The faster process represented the reaction of primary hydroxyl and acetyl groups, while the slower process represented the reaction of the two secondary hydroxyl and acetyl groups. Equilibrium and rate constants and initial and final concentrations of hydroxyl and acetyl groups were calculated for the two simultaneous reactions.

Reverse polymerization

H. H. G. Jellinek. *J. of Polymer Sci. 10,* 457-62 (May, 1953).

A reverse polymerization process with random initiation has been calculated. Initial stages of various degradation processes have been considered and the initial rates of formation of monomer have been presented as a function of the total number of monomer units present in the system, the initial chain length, etc.

Structure of branched polymers

W. Simpson, T. Holt and R. J. Zetie. *J. of Polymer Sci. 10,* 489-98 (May, 1953).

A rapid method of analysis of branched polymers is proposed which should be applicable to polymers of any poly-functional monomer the unsaturated groups of which are separated by saponifiable links. The method is based on the measurements of degree of polymerization and residual unsaturation of the polymer followed by saponification and determination of degree of polymerization of the resulting polymer, and involves the assumptions that branching in the polymer occurs only by the sharing of a monomer unit by two or more linear portions or branches depending on the number of double bonds in the monomer and also that the average degree of polymerization of the branches remains unchanged by the saponification treatment.

Symposium on fundamentals

Ind. and Eng. Chem. 45, 891-968 (May, 1953).

The review inaugurated in this issue was organized to fulfill the need for an annual survey of the research in basic phenomena that control chemical engineering processes. It complements the Unit Processes and Unit Operations Annual Reviews with a more complete coverage of fundamental papers on thermodynamics, chemical rate processes, fluid dynamics, and mass and heat transfer than was appropriate in the other reviews. In addition, the literature on colloidal and surface phenomena, computers, statistics, and mathematics, not covered in previous reviews, is represented by suitable sections in the new feature.